Amendments to the Claims:

Please amend claims 1, 11, 20, 28, 32, 38, 42, 57, 61, 65, 70 and 71 and cancel claims 4, 15, 24, 26, 27, 30, 35, 40, 44, 46, 48-50, 52-55, 59, 63, 68, 73, 75 and 77-80 as shown in the listing of claims below. This listing of claims will replace all prior versions and listings of claims in the application.

1. (currently amended) A method for high-speed transmission of information data on an optical channel, the method comprising:

encoding information via a trellis encoder to produce digital multilevel symbols;

equalizing the digital multilevel symbols to compensate for characteristics of the optical channel, said equalizing comprising precoding the digital multilevel symbols using a Tomlinson Harashima precoder comprising a modulo block operable to perform a wrap-around operation on the digital multilevel symbols;

converting the digital multilevel symbols into analog multilevel signals; and

transmitting the analog multilevel signals over the optical channel.

2-4. (cancelled)

5. (previously presented) The method of claim 1 wherein equalizing the digital multilevel symbols comprises precoding the digital multilevel symbols using a dynamic limiting precoder.

6. (previously presented) The method of claim 1 wherein the information that is encoded comprises input bits and wherein encoding the information includes mapping the input bits into digital multilevel symbols.

7. (previously presented) The method of claim 1 wherein transmitting the analog multilevel signals over an optical channel comprises modulating the intensity of a light source according to the level of the analog multilevel signals.

8. (previously presented) The method of claim 1 wherein transmitting the analog

multilevel signals over an optical channel comprises modulating laser intensity according to the level of the analog multilevel signals.

9. (previously presented) A method as in claim 1 wherein equalizing the digital multilevel symbols to compensate for the laser and channel characteristics comprises:
characterizing the channel; and
applying an inverse characterization of the channel to the digital multilevel symbols.

10. (cancelled)

11. (currently amended) A method for high speed transmission on an optical channel, the method comprising:
accepting information from a plurality of sources;
encoding the information via a plurality of trellis encoders to produce a plurality of digital multilevel symbols;
equalizing the plurality of digital multilevel symbols to compensate for characteristics of the optical channel, said equalizing comprising precoding the digital multilevel symbols using a Tomlinson Harashima precoder comprising a modulo block operable to perform a wrap-around operation on the digital multilevel symbols;
converting the plurality of digital multilevel symbols into a plurality of analog multilevel signals; and
transmitting the analog multilevel signals by time division multiplexing the plurality of analog multilevel signals onto an optical channel.

12. (previously presented) A method as in claim 11 wherein the accepted information comprises input bits and wherein encoding the information comprises:
mapping the input bits into digital multilevel symbols .

13-15. (cancelled)

16. (previously presented) The method of claim 11 wherein equalizing the digital

multilevel symbols comprises precoding the digital multilevel symbols using a dynamic limiting precoder.

17. (cancelled)

18. (previously presented) The method of claim 11 wherein transmitting the analog multilevel signals over an optical channel comprises modulating the intensity of a light source according to the level of the analog multilevel signals.

19. (previously presented) The method of claim 11 wherein transmitting the analog multilevel signals over an optical channel comprises modulating laser intensity according to the level of the analog multilevel signals.

20. (currently amended) A method as in claim ~~1~~ 11 wherein equalizing the digital multilevel symbols to compensate for the laser and channel characteristics comprises:
　　characterizing the channel; and
　　using an inverse characterization of the channel to modify the digital multilevel symbols.

21. (cancelled)

22. (previously presented) The method of claim 11 wherein converting the plurality of digital multilevel symbols into a plurality of analog multilevel signals comprises:
　　accepting the plurality of multilevel symbols successively into a single analog to digital converter; and
　　successively converting the plurality of symbols into analog multilevel signals.

23. (previously presented) The method of claim 11 wherein converting the plurality of digital multilevel symbols into a plurality of analog multilevel signals comprises:
　　accepting the plurality of multilevel symbols successively into a plurality of analog to digital converters; and
　　converting the plurality of symbols into an analog representation; and

successively combining the analog multilevel signals into a succession of analog multilevel signals.

24-27. (cancelled)

28. (currently amended) A method of signaling over an optical channel, the method comprising:

accepting data from a source;

trellis encoding the data;

equalizing the data, said equalizing comprising precoding the data using a Tomlinson Harashima precoder comprising a modulo block operable to perform a wrap-around operation on the data;

coupling the equalized encoded data into an optical channel;

conveying the data over the optical channel;

accepting data from the optical channel;

decoding the data accepted from the optical channel; and

providing the decoded data to an interface.

29-30. (cancelled)

31. (previously presented) A method as in claim 28 wherein equalizing the data comprises applying a dynamic limiting precoding.

32. (currently amended) An apparatus for transmitting information on an optical channel, the apparatus comprising:

a trellis encoder for accepting digital information and producing digital multilevel signals;

an equalizer that accepts the digital multilevel signals and produces equalized digital multilevel signals, the equalizing comprising a Tomlinson Harashima precoder comprising a modulo block operable to perform a wrap-around operation on the digital multilevel symbols;

a digital to analog converter that accepts the equalized digital multilevel signals and

produces analog multilevel signals; and

an analog signal to optical converter that converts the analog signal to an optical signal for coupling into an optical channel.

33-35. (cancelled)

36. (previously presented) An apparatus as in claim 32 wherein the equalizer is a dynamic limiting precoder.

37. (previously presented) An apparatus as in claim 32 wherein the analog signal to optical converter includes a laser.

38. (currently amended) An apparatus for concurrently transmitting a plurality of data signals over an optical channel, the apparatus comprising:

a plurality of trellis encoders that accept a plurality of data signals and produce a plurality of digital multilevel signals;

a plurality of equalizers that accept the plurality of digital multilevel signals and produce a plurality of equalized digital multilevel signals, each equalizer comprising a Tomlinson Harashima precoder comprising a modulo block operable to perform a wrap-around operation on the digital multilevel signals;

a converter that accepts the plurality of equalized digital multilevel signals and produces a plurality of analog multilevel signals; and

an optical source that receives the plurality of analog multilevel signals and produces a light output proportional to the level of successive analog multilevel signals for driving an optical channel.

39-40. (cancelled)

41. (previously presented) An apparatus as in claim 38 wherein the plurality of equalizers comprise at least one dynamic limiting precoder.

42. (currently amended) An apparatus for concurrently transmitting a plurality of data signals over an optical channel, the apparatus comprising:

a plurality of trellis encoders that accept a plurality of data signals and produce a plurality of digital multilevel signals;

a plurality of equalizers that accept the plurality of digital multilevel signals and produce a plurality of equalized digital multilevel signals, each equalizer comprising a Tomlinson Harashima precoder comprising a modulo block operable to perform a wrap-around operation on the digital multilevel signals;

an digital to analog converter that sequentially accepts the plurality of equalized digital multilevel signals and produces a plurality of sequential analog multilevel signals; and

an optical source that receives the plurality of analog multilevel signals for driving an optical channel.

43-44. (cancelled)

45. (previously presented) An apparatus as in claim 42 wherein the plurality of equalizers comprise at least one dynamic limiting precoder.

46-56. (cancelled)

57. (currently amended) A method of signaling over an optical channel, the method comprising:

accepting data from a source;

multilevel modulating the data;

equalizing the data, said equalizing comprising precoding the data using a Tomlinson Harashima precoder comprising a modulo block operable to perform a wrap-around operation on the data;

coupling the equalized encoded data into an optical channel;

conveying the data over the optical channel;

accepting data from the optical channel;

decoding the data accepted from the optical channel; and

providing the decoded data to an interface.

58-59. (cancelled)

60. (previously presented) A method as in claim 57 wherein equalizing the data comprises applying a dynamic limiting precoding.

61. (currently amended) A method of signaling over an optical channel, the method comprising:

accepting data from a source;

multilevel modulating the data;

equalizing the data, said equalizing comprising precoding the data using a Tomlinson Harashima precoder comprising a modulo block operable to perform a wrap-around operation on the data;

coupling the equalized encoded data into an optical channel;

conveying the data over the optical channel;

accepting data from the optical channel;

converting the data accepted from the optical channel to digital data;

decoding the digital data accepted from the optical channel; and

providing the decoded data to an interface.

62-63. (cancelled)

64. (previously presented) A method as in claim 61 wherein equalizing the data comprises applying a dynamic limiting precoding.

65. (currently amended) An apparatus for transmitting information on an optical channel, the apparatus comprising:

a modulator for accepting digital information and producing digital signals;

an equalizer that accepts the digital signals and produces equalized digital signals, the equalizer comprising a Tomlinson Harashima precoder comprising a modulo block operable to

perform a wrap-around operation on the digital signals;

a digital to analog converter that accepts the equalized digital signals and produces analog signals; and

an analog signal to optical converter that converts the analog signal to an optical signal for coupling into an optical channel.

66-68. (cancelled)

69. (previously presented) An apparatus as in claim 65 wherein the equalizer is a dynamic limiting precoder.

70. (currently amended) An apparatus as in claim ~~32~~ 65 wherein the analog signal to optical converter includes a laser.

71. (currently amended) An apparatus for concurrently transmitting a plurality of data signals over an optical channel, the apparatus comprising:

a plurality of modulators that accept a plurality of data signals and produce a plurality of digital signals;

a plurality of equalizers that accept the plurality of digital signals and produce a plurality of equalized digital signals, each equalizer comprising a Tomlinson Harashima precoder comprising a modulo block operable to perform a wrap-around operation on the digital signals;

a converter that accepts the plurality of equalized digital multilevel signals and produces a plurality of analog multilevel signals; and

an optical source that receives the plurality of analog signals and produces a light output proportional to the level of successive analog signals for driving an optical channel.

72-73. (cancelled)

74. (previously presented) An apparatus as in claim 71 wherein the plurality of equalizers comprise at least one dynamic limiting precoder.

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75-80. (cancelled)